RESTORATION OF ENDODONTICALY TREATED TEETH

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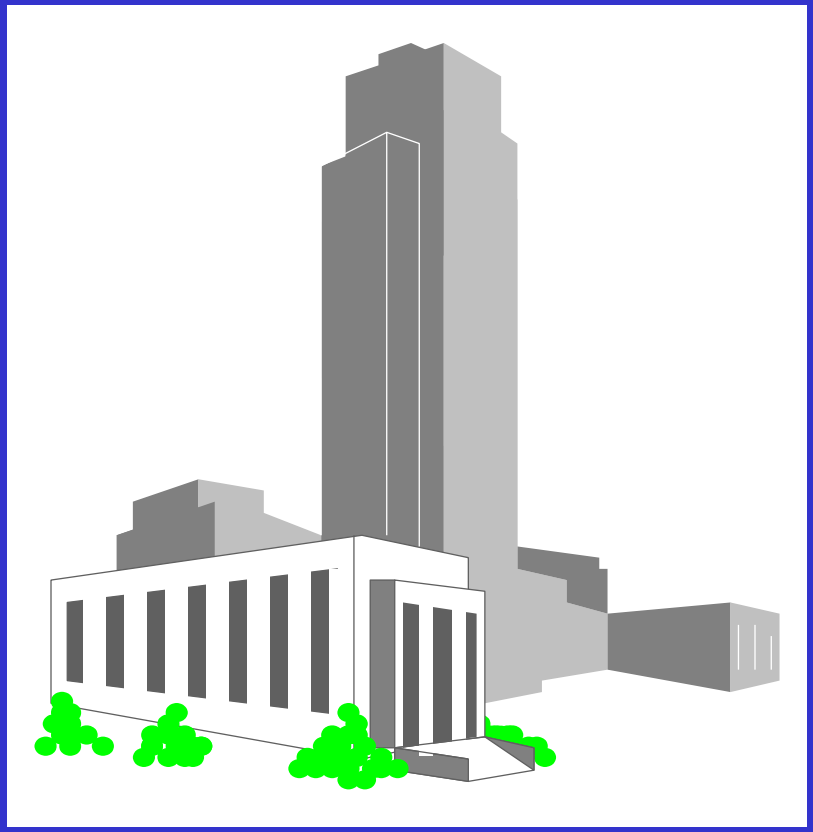
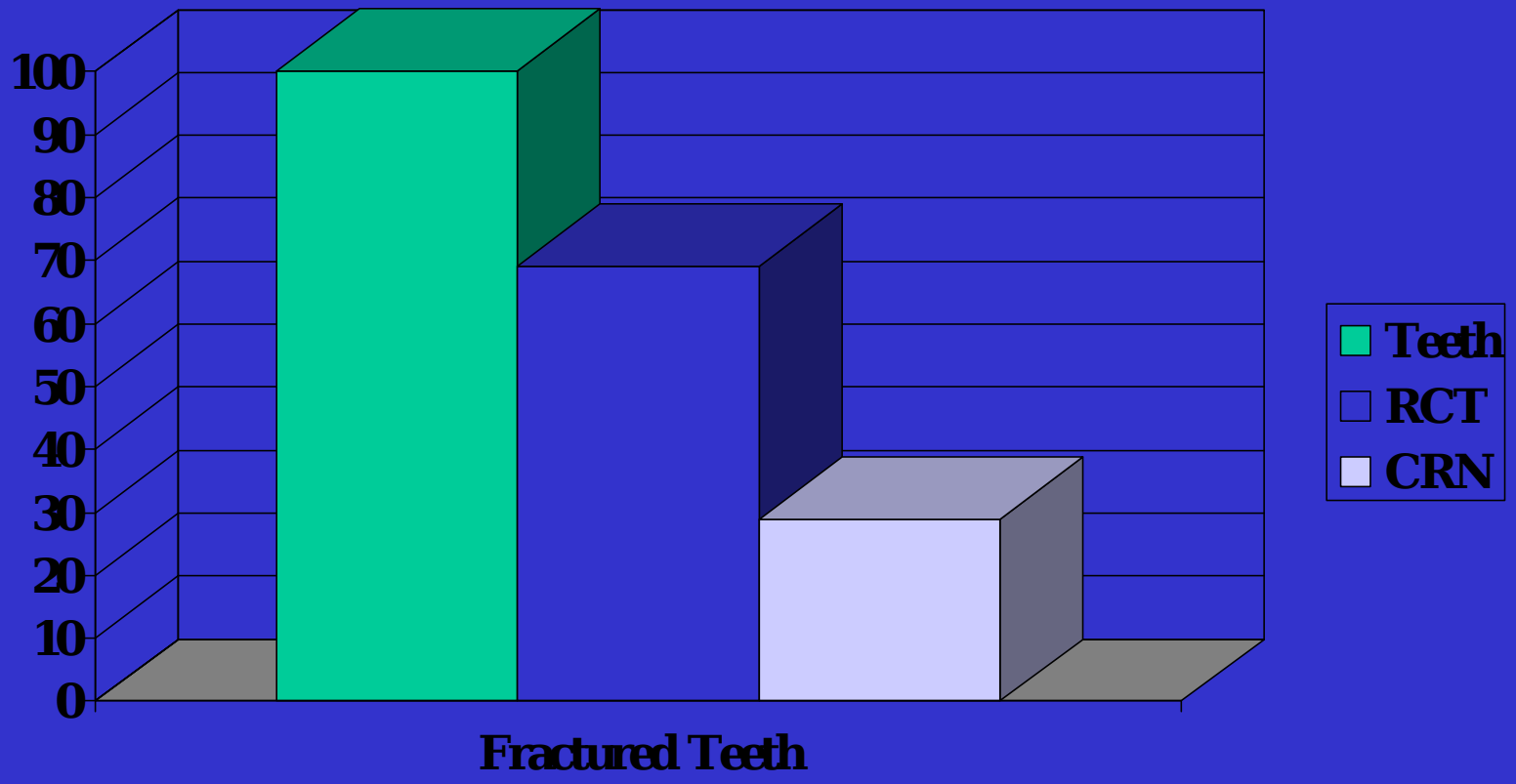


100 FRACTURED TEETH

- Root canal treatment; 69
- 29 of the 69 had full coverage castings
- Of the 69
  - 1st year 24%
  - 1-5 years 35%
  - 5-20 years 41%
    - Gher et al; JADA, vol. 114, Feb 1987

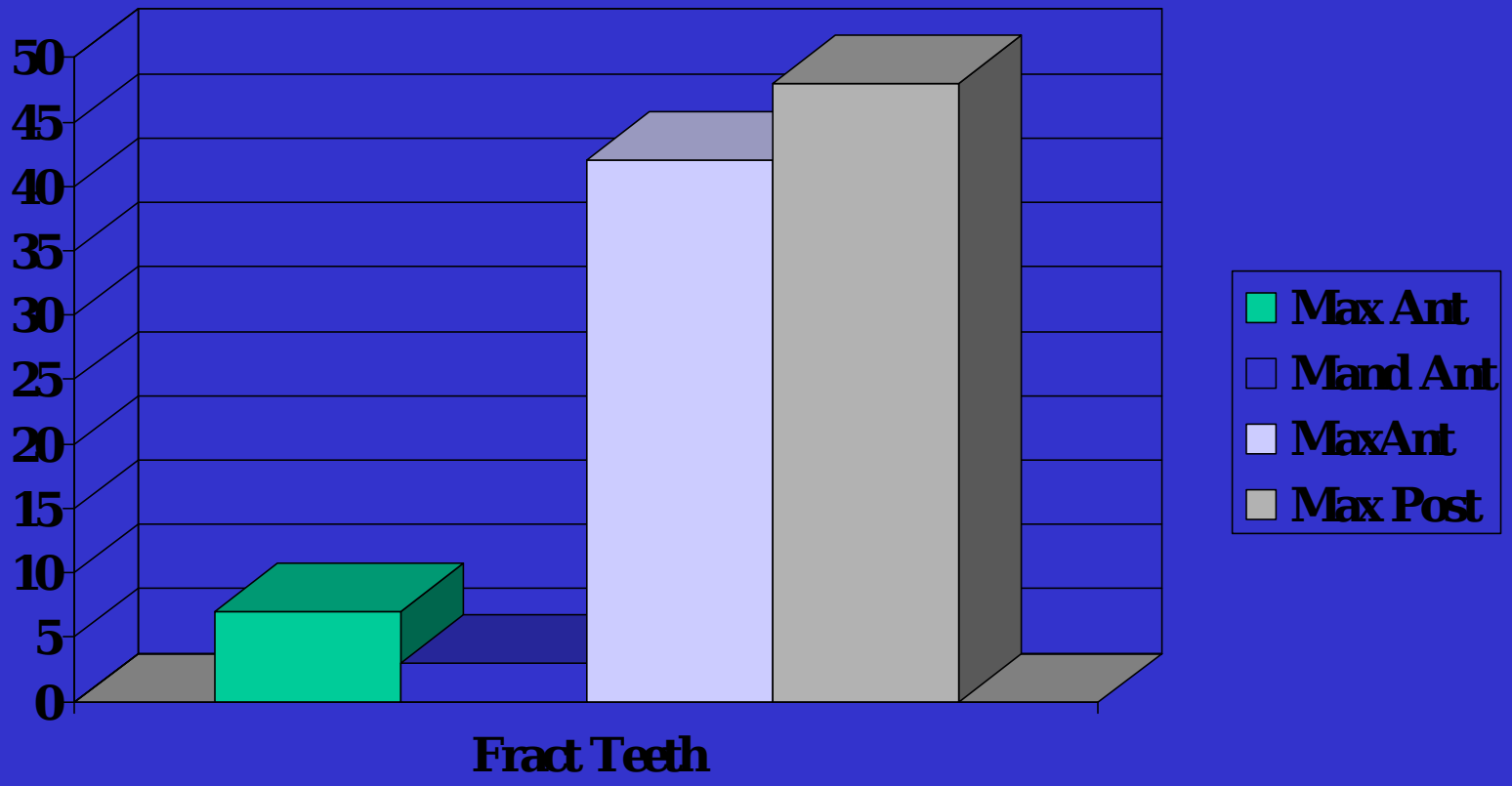
100 FRACTURED TEETH



WHICH TEETH?

- Max Anterior 7%
- Mand Anterior 3%
- Max Posterior 42%
- Mand Posterior 48%

PERCENT FRACTURED



THE PROBLEM

- Tooth susceptible to fracture
- 9% moisture loss
- Weakened collagen
- Unroofed tooth structure
- Altered tooth morphology

THE SOLUTION

- “Reinforce tooth”?
- “Protect tooth”?

Do post-cores “reinforce” endodontically treated teeth?

“ A post-core does not increase the fracture resistance of endodontically treated teeth”

Guzy GE: J Prosthet Dent 1977

“Preparing a post space significantly weakened endodontically treated teeth”

“Trope M, et al: Endodont Dent Traumatol 1985

BONDED POSTS ?

- There is hope that bonding will reinforce the tooth. Some early in vitro studies have indicated a strengthening of the tooth.
- Other studies have shown no significant or a transient effect.
- Clinical studies are lacking and not of long term.

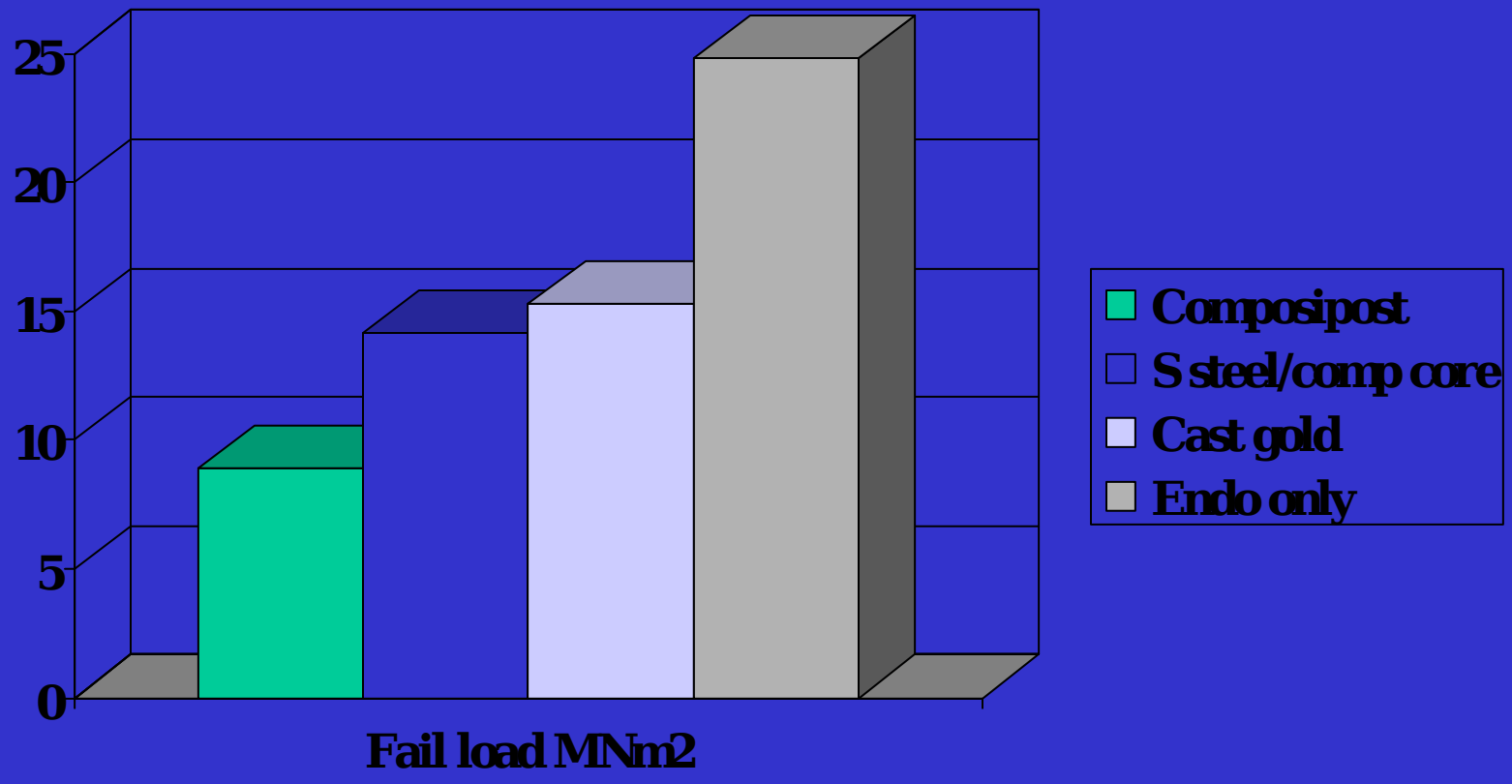
FRACTURE RESISTANCE OF POST TYPES

1. Teeth with metal posts (or no post) have more fracture resistance than composite cores retained by non metallic posts.

2. However, more of the fractures were unfavorable.

3. 1mm ferrule

Sidoli et al; J Prosthet Dent 1997



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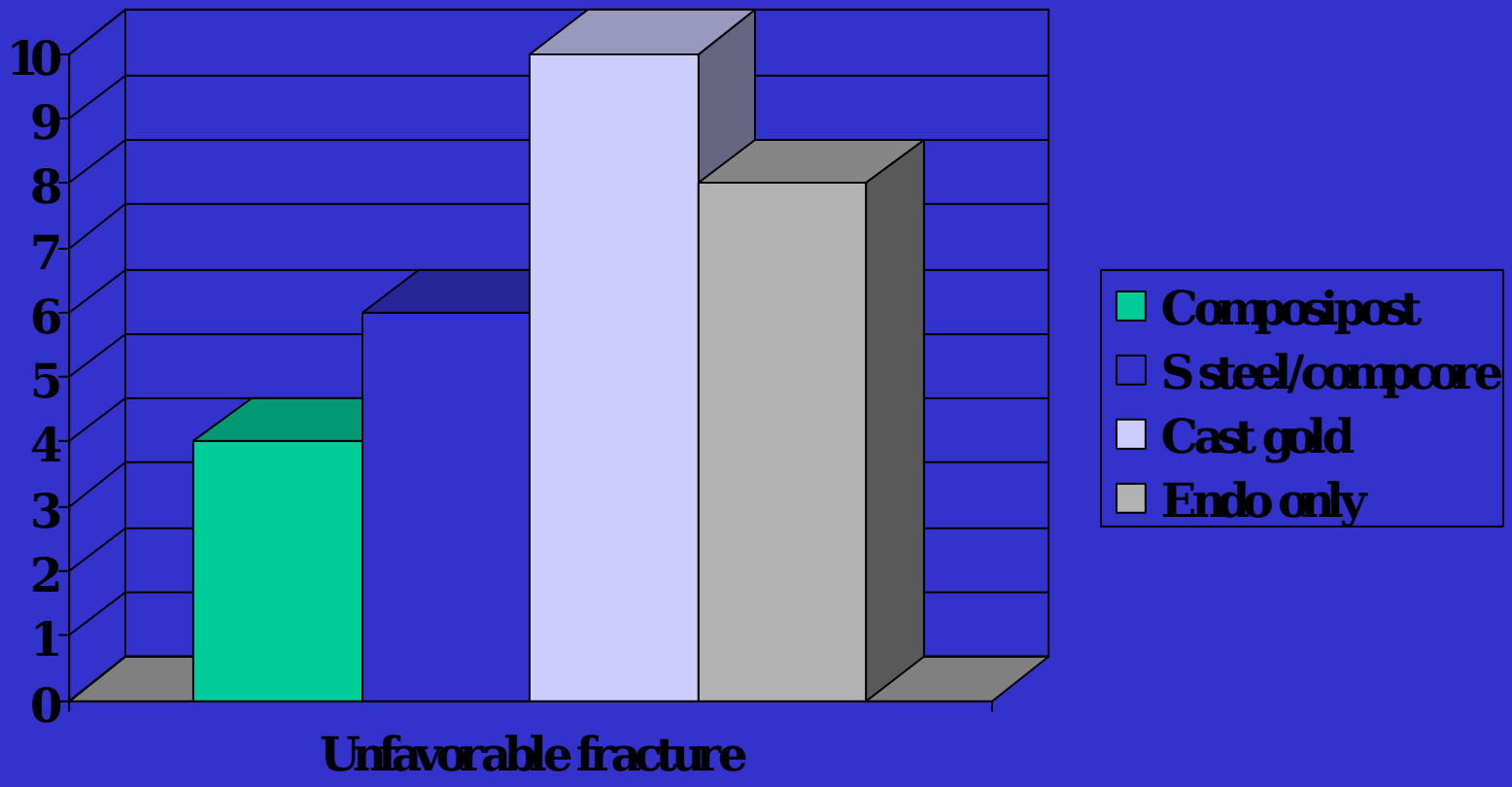


CEMENT/BONDING?

- There is no difference in torsional resistance of a composite core supported by a prefabricated post when bonded or cemented with ZNPO4.
- Cohen et al; J prosthet Dent 1999; June

Failure

Question: What is the most common cause of failure in endodontically treated teeth?

ANSWER

Improper restoration of the tooth!!!!!!

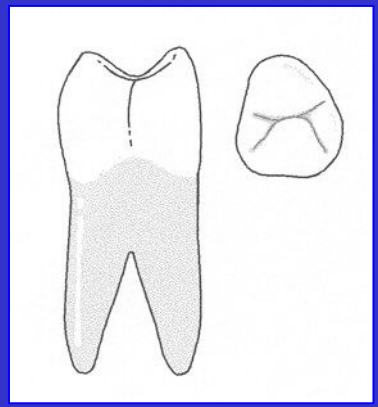
1. Tooth fracture
2. Perforation
3. Disruption of the gutta percha seal

PROTECTION OF ANTERIOR TEETH?

- Coronal coverage does not significantly improve the success of Anterior RCT.
- Several studies have concluded that remaining tooth structure was more significant for preventing fracture of the tooth and retention of the restoration than was post design or use in anterior teeth.

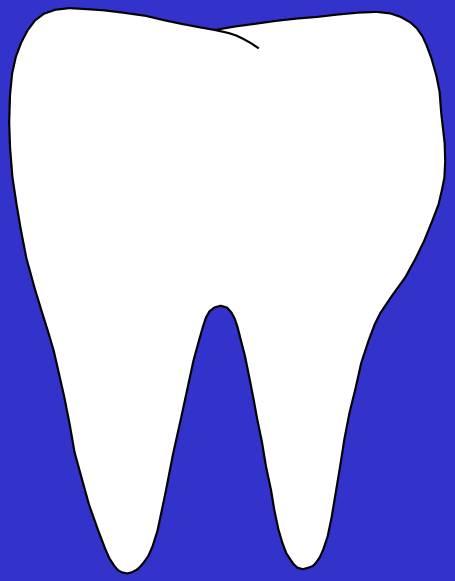
PROTECTION OF PREMOLARS

- Can be subjected to strong lateral forces
- Minimal dentin structure after preparation for PFM crown
- Consider esthetic onlay if sufficient tooth structure remains.
- Post and core if not. Consider crown lengthening for ferrule.



PROTECTION OF MOLARS

- Most frequently fractured teeth.
- Cuspal coverage mandatory when in occlusion.
- Generally posts not required.
- Ferrule



CUSPAL COVERAGE AMALGAMS

- Amalgam you ugly bastard, I thought you died!
- Research is lacking on the suitability of cuspal coverage chamber retained amalgams.
- However, complex amalgams have faired well compared to crowns in many studies and can be conservative of tooth structure and kind to the periodontium.
- Esthetics and the occlusion are determining factors.

DO ALL RCT TEETH NEED "PROTECTION"

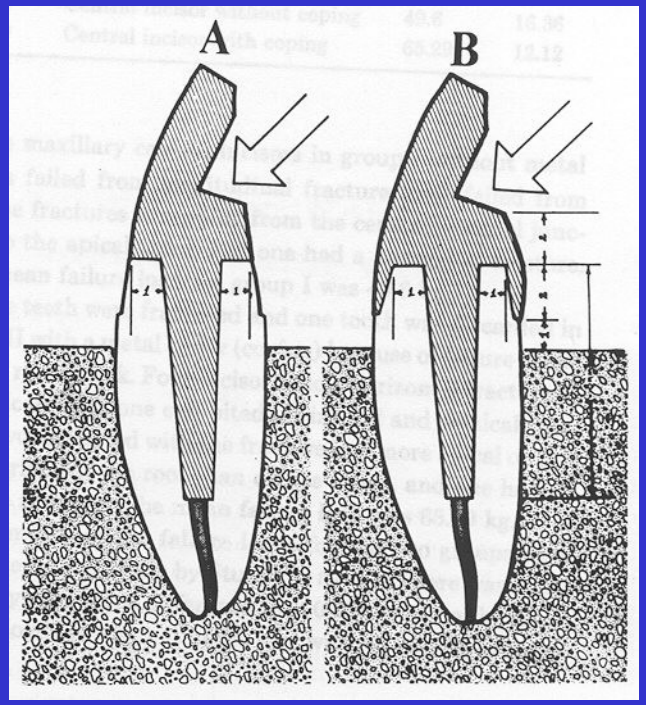
Anteriors

No, But may need post/core to restore tooth

Posteriors

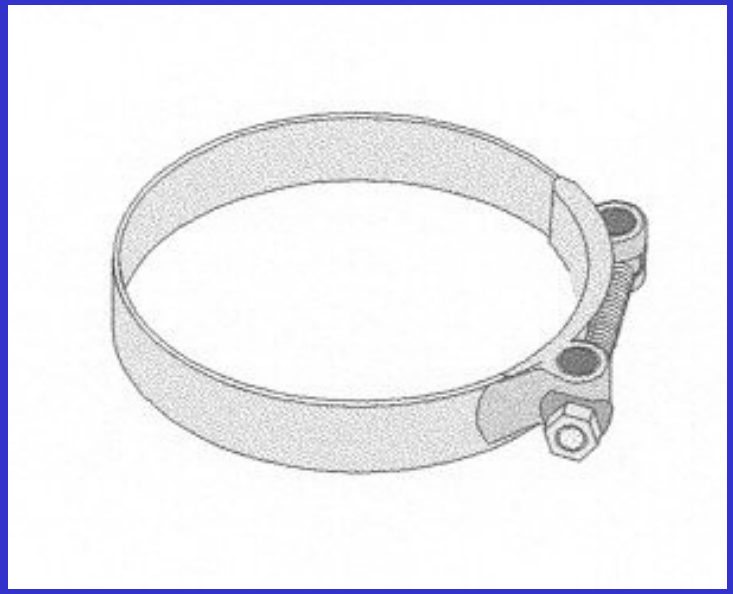
YES !!!!!!!!! (unless not in occlusion)

FERRULE (GIRDLE)

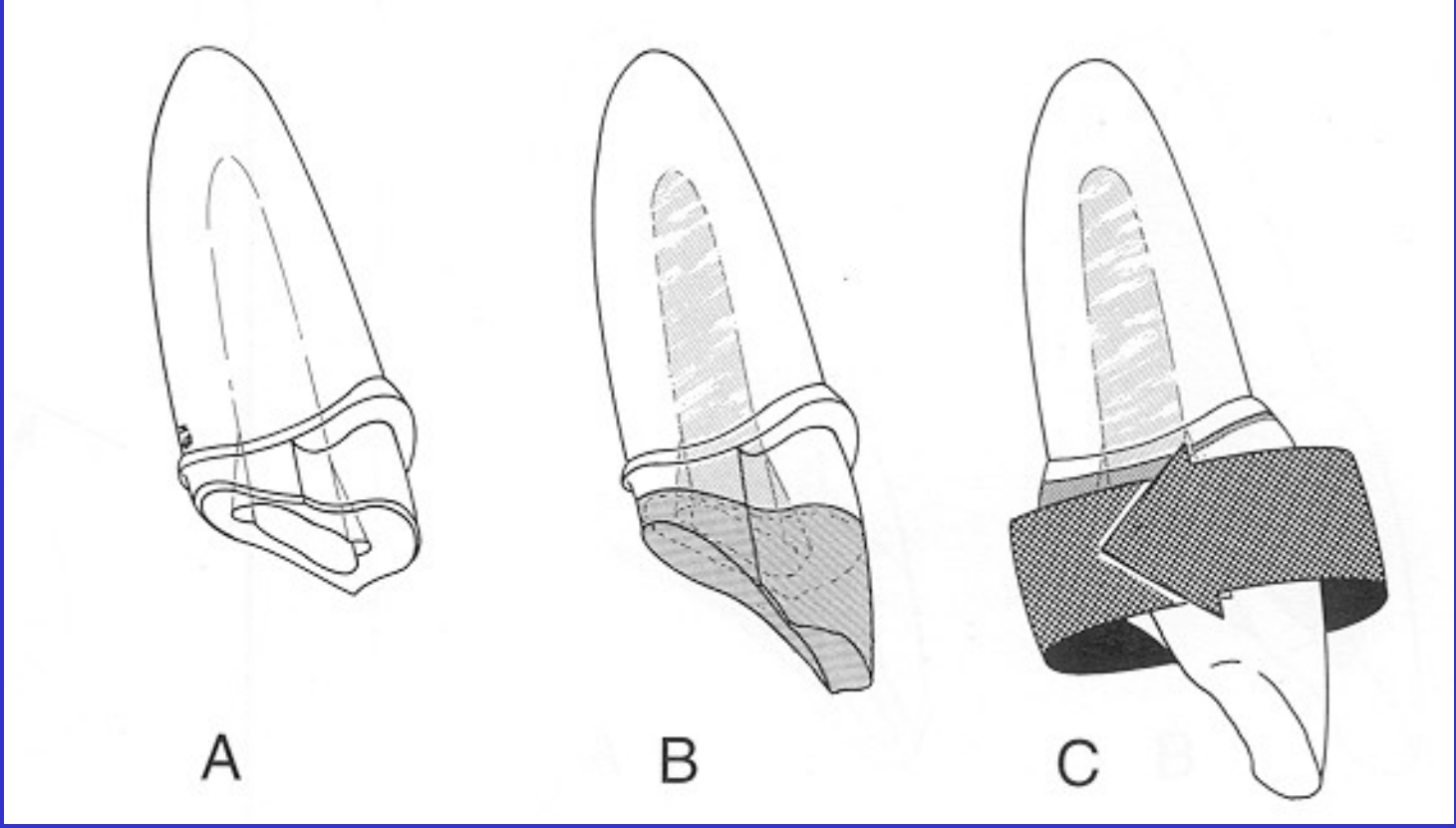


CERVICAL FERRULE

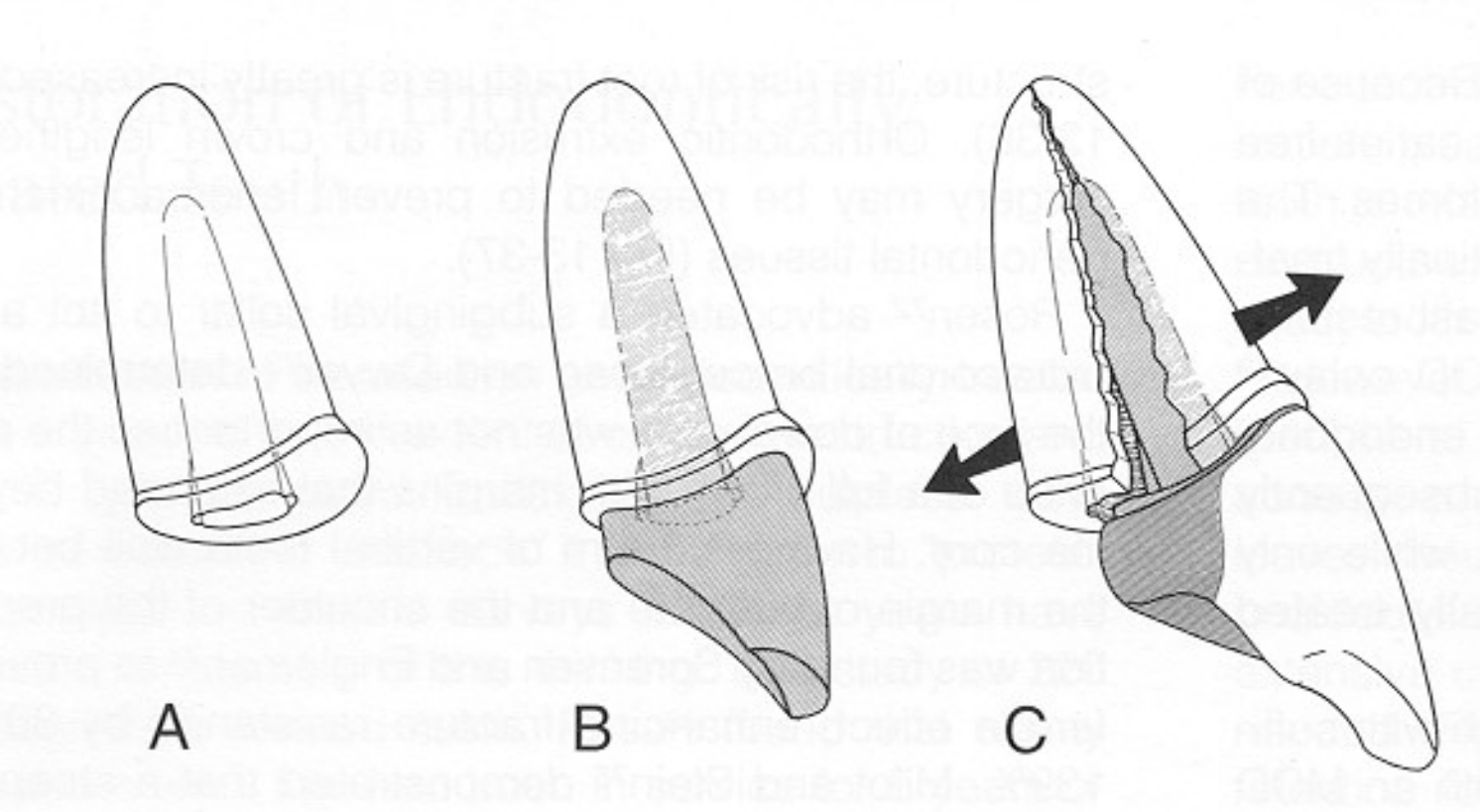
- YES !!!!!
- Increased fracture resistance
- Antirotational
- Consider crown lengthening and or extrusion



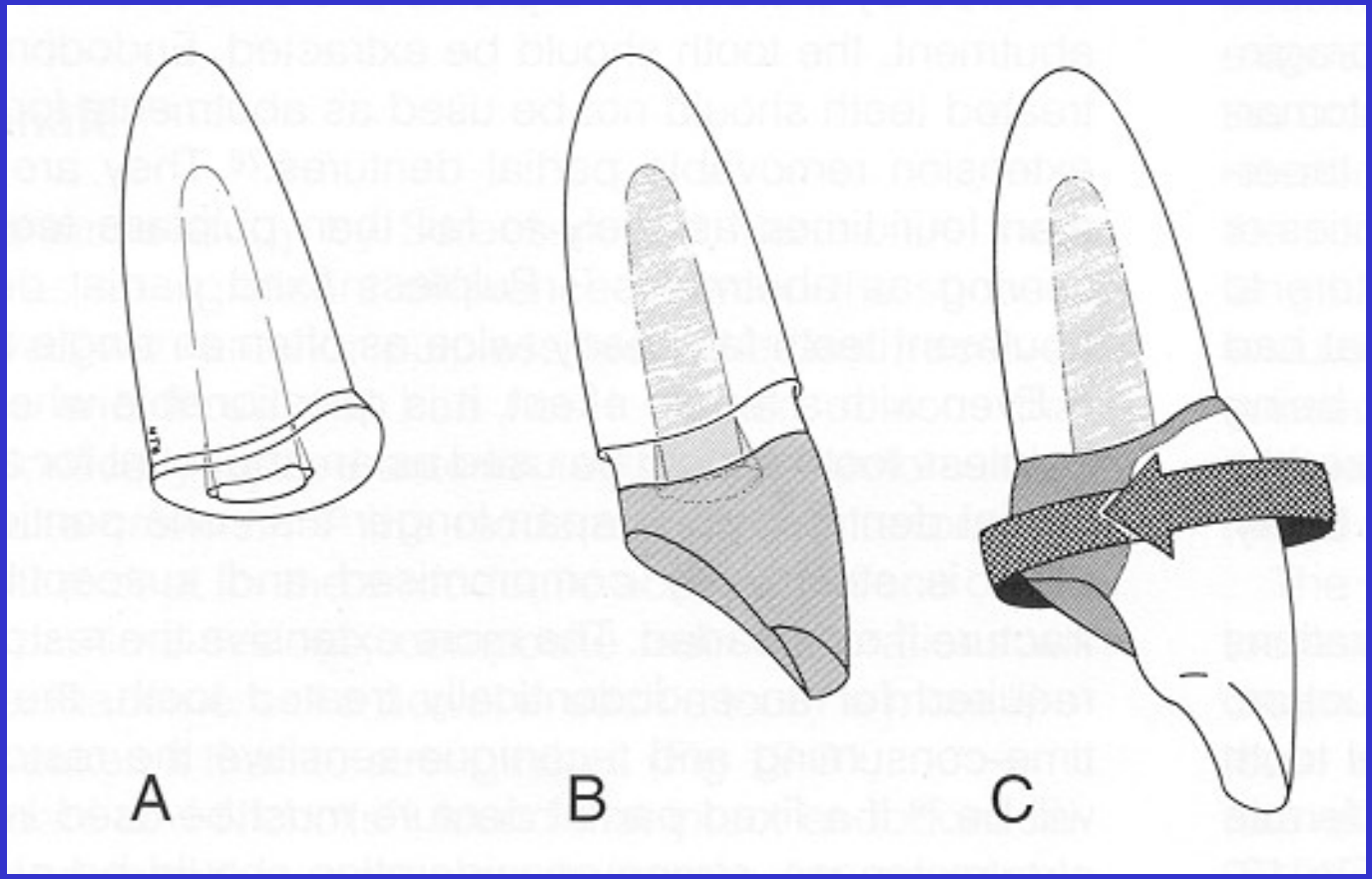
FERRULE EFFECT



NO FERRULE

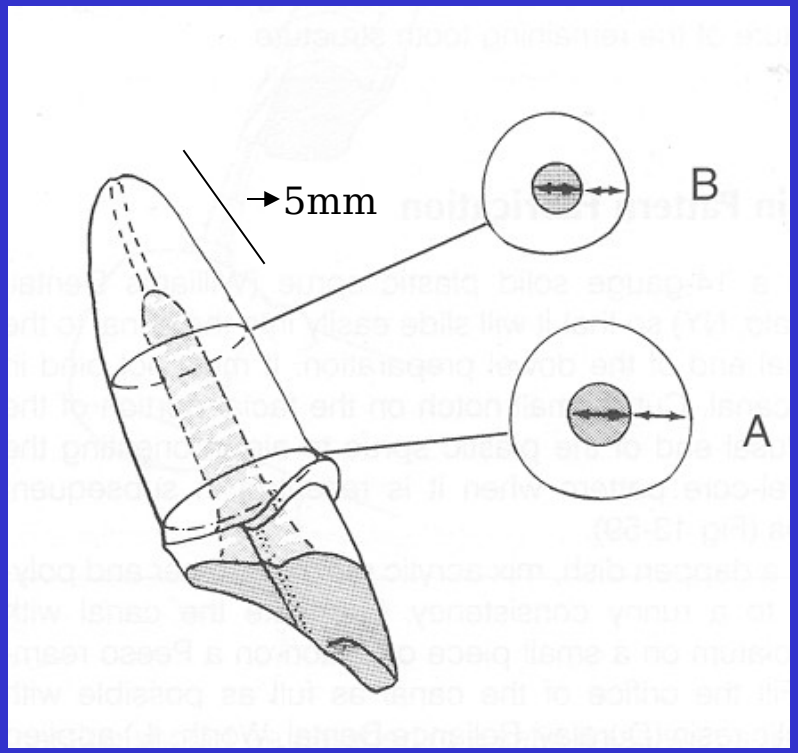


ADD CROWN LENGTH

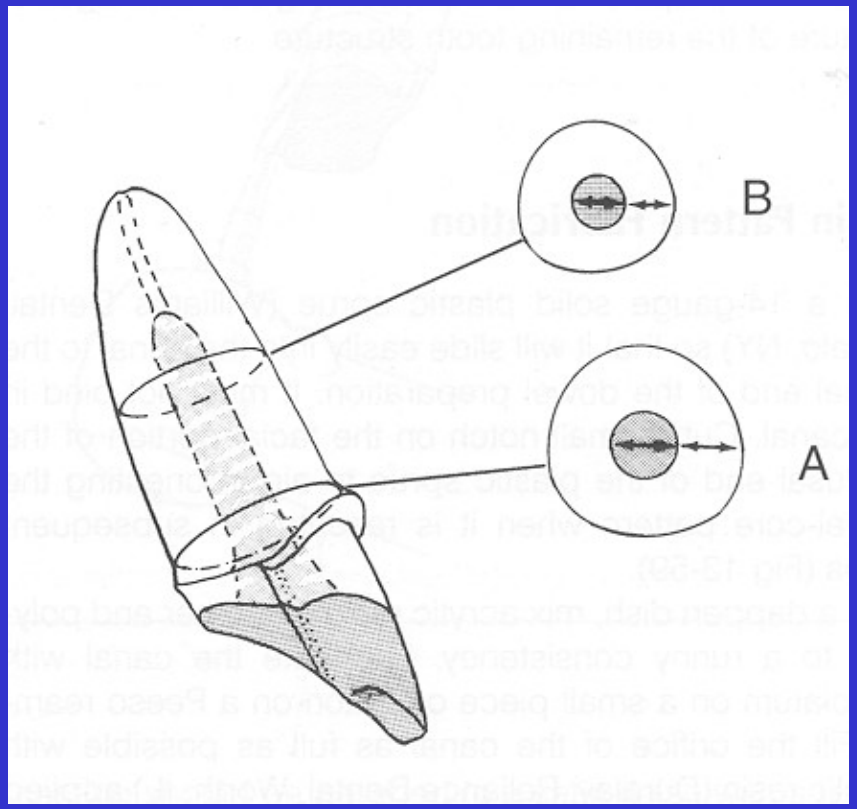


POST DIMENSION

- 9mm ideal (Turner)
- 3/4 root length (Sorenson)
- > Crown length (Shillingburg)
- 5mm remaining gutta percha



POST DIAMETER



B. Minimum 2mm less than diameter

A. Max 1/3 root diam at CEJ

Bottom line: remove as little tooth structure as possible

GUTTA PERCHA SEAL

Research

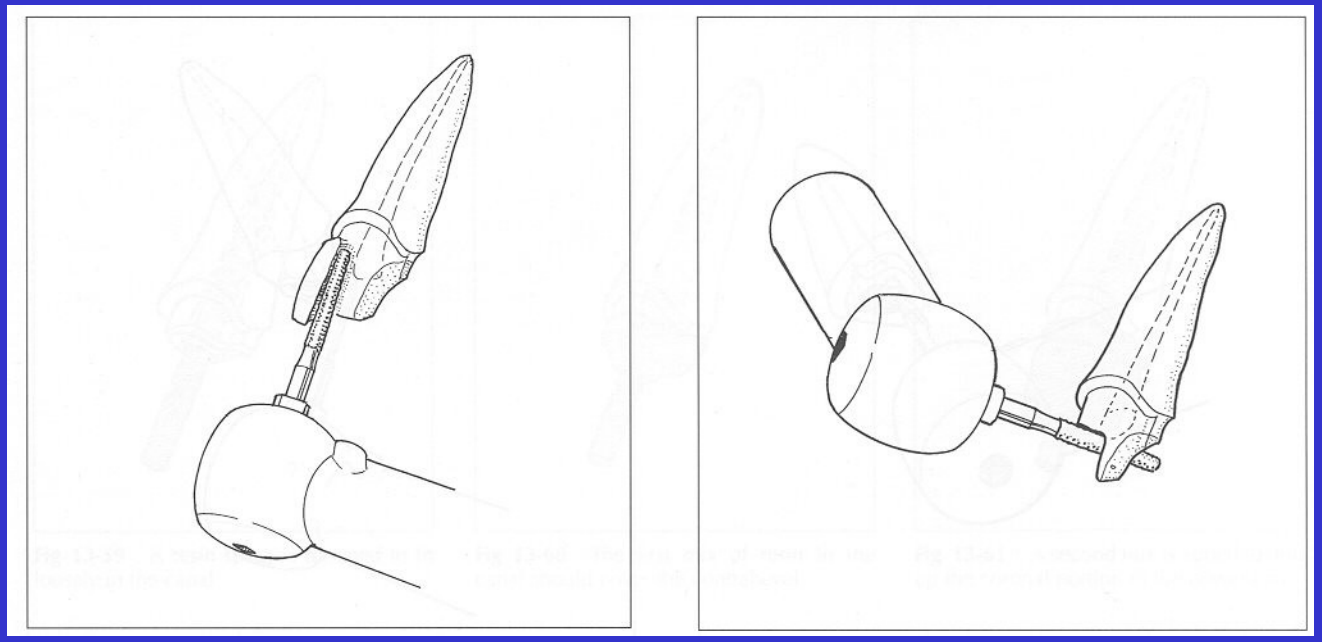
1. Teeth with posts have more apical periodontitis.

Eckerbom et al; Endo Dent Traumatol;1991

2. Teeth with less than 3mm remaining RCF have significantly more radiolucencies.

Kvist et al; J Endo;1989

POST PREPARATION



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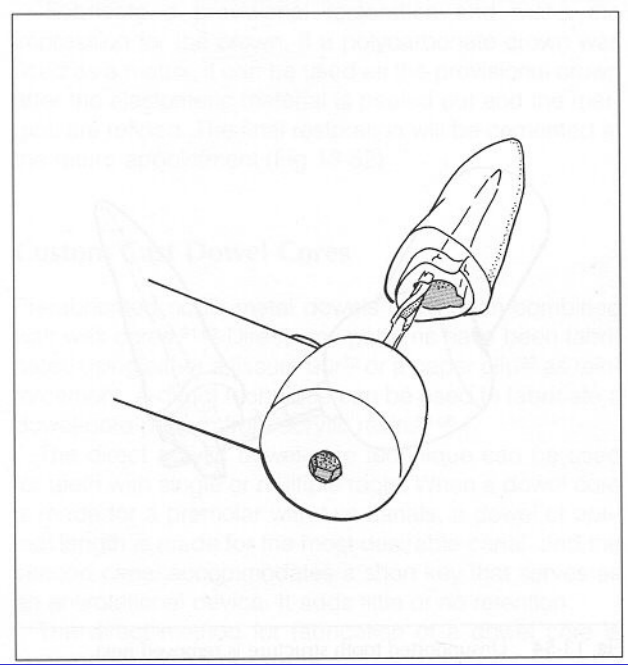
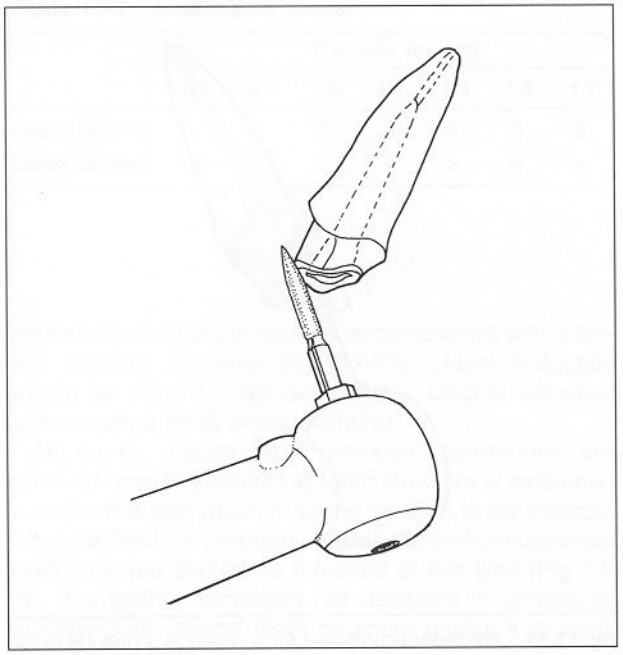
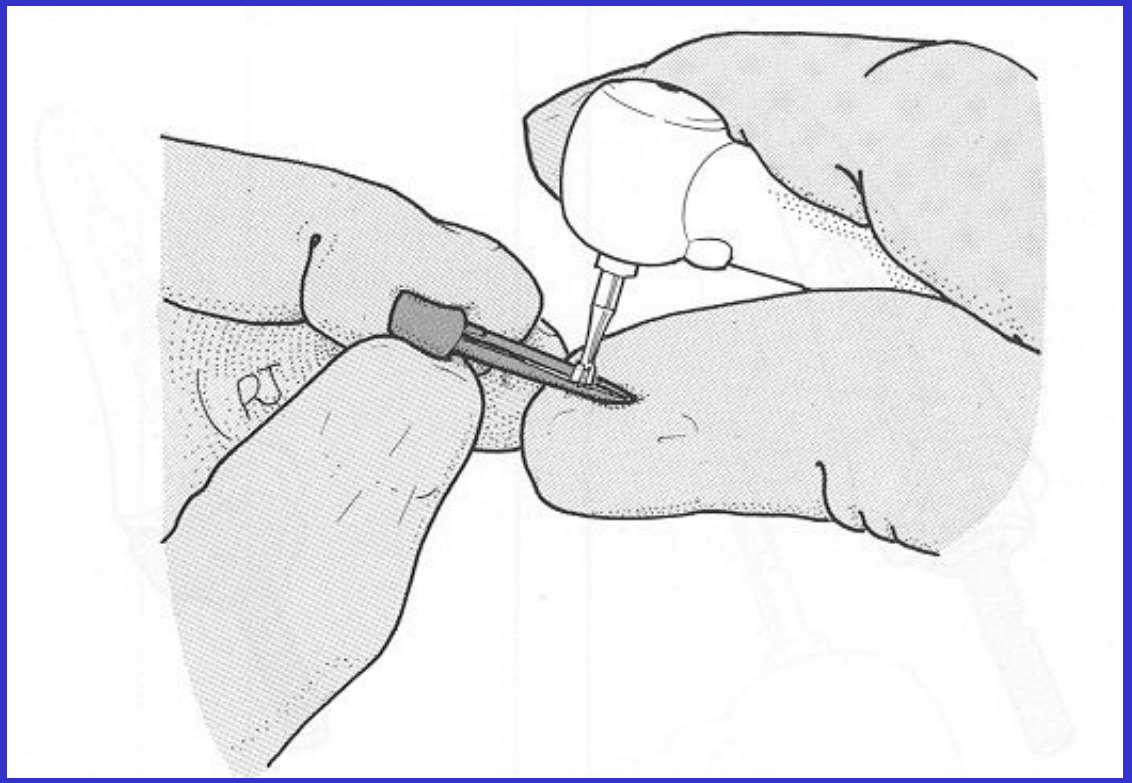




VENTING



THE FUTURE

- It is hoped that reinforcement with bonding agents will come to fruition.
- With esthetic all ceramic (Empress, etc) coming into their own, Posts will need to be more tooth colored.